

WHAT IS CLAIMED IS:

- 1 1. A method for facilitating acknowledgement of a request for altering a multicast group
2 membership status, comprising:
3 receiving an Internet Group Management Protocol (IGMP) Membership Report
4 message designating a request for altering a present membership status with
5 respect to designated multicast information;
6 determining a membership action associated with the IGMP Membership Report
7 message;
8 preparing a membership acknowledge message in response to determining the
9 membership action, wherein the membership acknowledgment message
10 designates a resulting membership status associated with the request for
11 altering the present membership status; and
12 transmitting the membership acknowledge message for reception by a requesting
13 system.
- 1 2. The method of claim 1 wherein:
2 determining the membership action includes confirming an inability to implement
3 the request for altering the present membership status; and
4 preparing the membership acknowledge message includes preparing an IGMP
5 negative acknowledge message.
- 1 3. The method of claim 2 wherein preparing the IGMP negative acknowledge message
2 includes:
3 specifying an acknowledgement indicator in a message type field of an IGMP
4 message;
5 specifying a multicast group identifier associated with the particular multicast
6 group in a multicast group identifier field of the IGMP message; and
7 specifying a negative acknowledgement indicator in an acknowledgment type field
8 of the IGMP message, the negative acknowledgement indicator designates the
9 inability to implement the request for altering the present membership status.
- 1 4. The method of claim 3 wherein:

receiving the IGMP Membership Report message includes receiving an IGMP Membership Report message; and
the IGMP Membership Report message requests membership in a particular multicast group for receiving said designated multicast information.

5. The method of claim 4 wherein preparing the negative acknowledgment message includes specifying supplemental membership action information in an additional cause information field of the IGMP message.

6. The method of claim 3 wherein:
receiving the IGMP Membership Report message includes receiving an IGMP Leave Group message; and
the IGMP Leave Group message requests removal from a particular multicast group receiving said designated multicast information.

7. The method of claim 6 wherein preparing the negative acknowledgment message includes specifying supplemental membership action information in an additional cause information field of the IGMP message.

8. The method of claim 1 wherein:
determining the membership action includes confirming an ability to implement the request for altering the present membership status; and
preparing the membership acknowledge message includes preparing an affirmative acknowledge message.

9. The method of claim 8 wherein preparing the affirmative acknowledge message includes:
specifying an acknowledgement indicator in a message type field of an IGMP message;
specifying a multicast group identifier associated with the particular multicast group in a multicast group identifier field of the IGMP message; and
specifying an affirmative acknowledgement indicator in an acknowledgment type field of the IGMP message, the affirmative acknowledgement indicator

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designates the ability to implement the request for altering the present membership status.

10. The method of claim 9 wherein:

receiving the IGMP Membership Report message includes receiving an IGMP Leave Group message; and
the IGMP Leave Group message requests removal from a particular multicast group receiving said designated multicast information.

11. The method of claim 9 wherein:

receiving the IGMP Membership Report message includes receiving an IGMP Membership Report message; and
the IGMP Membership Report message requests membership in a particular multicast group for receiving said designated multicast information.

1 12. A method for facilitating acknowledgment of a request for altering a multicast group
2 membership status, comprising:
3 receiving an Internet Group Management Protocol (IGMP) Membership Report
4 message, wherein the IGMP Membership Report message is transmitted from
5 a requesting system and requests membership in a particular multicast group
6 for receiving designated multicast information;
7 confirming an ability to implement membership of the requesting system in the
8 particular multicast group;
9 preparing a first affirmative acknowledge message after confirming the ability to
10 implement membership of the requesting system in the particular multicast
11 group, wherein preparing the first affirmative acknowledge message includes:
12 specifying acknowledge message in a type field of a first IGMP
13 message;
14 specifying an identifier of the particular multicast group in a multicast
15 group identifier field of the first IGMP message; and
16 specifying an affirmative acknowledgement in an acknowledgment
17 type field of the first IGMP message, the affirmative
18 acknowledgement designating the ability to implement membership
19 of the requesting system in the particular multicast group;
20 transmitting the first affirmative acknowledge message for reception by the
21 requesting system;
22 receiving an IGMP Leave Group message from the requesting system after
23 transmitting the first affirmative acknowledge message, wherein the IGMP
24 Leave Group message requests removal of the requesting system from the
25 particular multicast group;
26 confirming an ability to implement removal of the requesting system from the
27 particular multicast group; and
28 preparing a second affirmative acknowledge message after confirming the ability
29 to implement removal of the requesting system from the particular multicast
30 group, wherein preparing the second affirmative acknowledge message
31 includes:

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specifying acknowledge message in a type field of a first IGMP message;
specifying an identifier of the particular multicast group in a multicast group identifier field of the first IGMP message; and
specifying an affirmative acknowledgement in an acknowledgment type field of the first IGMP message, the affirmative acknowledgement designating the ability to implement removal of the requesting system from the particular multicast group.

- 1 13. A data processor program product for facilitating acknowledgment of a request for
2 altering a multicast group membership status, comprising:
3 a data processor program processable by a data processor;
4 an apparatus from which the data processor program is accessible by the data
5 processor; and
6 the data processor program being capable of enabling the data processor to
7 facilitate:
8 receiving an Internet Group Management Protocol (IGMP)
9 Membership Report message designating a request for altering a
10 present membership status with respect to designated multicast
11 information;
12 determining a membership action associated with the IGMP
13 Membership Report message;
14 preparing a membership acknowledge message in response to
15 determining the membership action, wherein the membership
16 acknowledgment message designates a resulting membership status
17 associated with the request for altering the present membership
18 status; and
19 transmitting the membership acknowledge message for reception by a
20 requesting system.
- 1 14. The data processor program product of claim 13 wherein enabling the data processor
2 to facilitate:
3 determining the membership action includes enabling the data processor to
4 facilitate confirming an inability to implement the request for altering the
5 present membership status; and
6 preparing the membership acknowledge message includes enabling the data
7 processor to facilitate preparing an IGMP negative acknowledge message.
- 1 15. The data processor program product of claim 14 wherein enabling the data processor
2 to facilitate preparing the IGMP negative acknowledge message includes:

enabling the data processor to facilitate specifying an acknowledgement indicator in a message type field of an IGMP message;

enabling the data processor to facilitate specifying a multicast group identifier associated with the particular multicast group in a multicast group identifier field of the IGMP message; and

enabling the data processor to facilitate specifying a negative acknowledgement indicator in an acknowledgment type field of the IGMP message, the negative acknowledgement indicator designates the inability to implement the request for altering the present membership status.

16. The data processor program product of claim 15 wherein:

enabling the data processor to facilitate receiving the IGMP Membership Report message includes enabling the data processor to facilitate receiving an IGMP Membership Report message; and

the IGMP Membership Report message requests membership in a particular multicast group for receiving said designated multicast information.

17. The data processor program product of claim 16 wherein enabling the data processor to facilitate preparing the negative acknowledgment message includes enabling the data processor to facilitate specifying supplemental membership action information in an additional cause information field of the IGMP message.

18. The data processor program product of claim 15 wherein:

enabling the data processor to facilitate receiving the IGMP Membership Report message includes enabling the data processor to facilitate receiving an IGMP Leave Group message; and

the IGMP Leave Group message requests removal from a particular multicast group receiving said designated multicast information.

19. The data processor program product of claim 18 wherein enabling the data processor to facilitate preparing the negative acknowledgment message includes enabling the data processor to facilitate specifying supplemental membership action information in an additional cause information field of the IGMP message.

20. The data processor program product of claim 13 wherein enabling the data processor to facilitate:

- determining the membership action includes enabling the data processor to facilitate confirming an ability to implement the request for altering the present membership status; and
- preparing the membership acknowledge message includes enabling the data processor to facilitate preparing an affirmative acknowledge message.

21. The data processor program product of claim 20 wherein enabling the data processor to facilitate preparing the affirmative acknowledge message includes:

- enabling the data processor to facilitate specifying an acknowledgement indicator in a message type field of an IGMP message;
- enabling the data processor to facilitate specifying a multicast group identifier associated with the particular multicast group in a multicast group identifier field of the IGMP message; and
- enabling the data processor to facilitate specifying an affirmative acknowledgement indicator in an acknowledgment type field of the IGMP message, the affirmative acknowledgement indicator designates the ability to implement the request for altering the present membership status.

22. The data processor program product of claim 21 wherein:

- enabling the data processor to facilitate receiving the IGMP Membership Report message includes enabling the data processor to facilitate receiving an IGMP Leave Group message; and
- the IGMP Leave Group message requests removal from a particular multicast group receiving said designated multicast information.

23. The data processor program product of claim 21 wherein:

- enabling the data processor to facilitate receiving the IGMP Membership Report message includes enabling the data processor to facilitate receiving an IGMP Membership Report message; and

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- 5 the IGMP Membership Report message requests membership in a particular
6 multicast group for receiving said designated multicast information.

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24. A system for facilitating acknowledgment of a request for altering a multicast group membership status, comprising:

- a multicast-capable system including a data processor; and
- a data processor program accessible by the data processor of the multicast-capable system;

the data processor program being capable of enabling the data processor of the multicast-capable system to facilitate:

- receiving an Internet Group Management Protocol (IGMP) Membership Report message designating a request for altering a present membership status with respect to designated multicast information;
- determining a membership action associated with the IGMP Membership Report message;
- preparing a membership acknowledge message in response to determining the membership action, wherein the membership acknowledge message designates a resulting membership status associated with the request for altering the present membership status; and
- transmitting the membership acknowledge message for reception by a requesting system.

25. The system of claim 24 wherein enabling the data processor to facilitate:

- determining the membership action includes enabling the data processor to facilitate confirming an inability to implement the request for altering the present membership status; and
- preparing the membership acknowledge message includes enabling the data processor to facilitate preparing an IGMP negative acknowledge message.

26. The system of claim 25 wherein enabling the data processor to facilitate preparing the IGMP negative acknowledge message includes:

enabling the data processor to facilitate specifying an acknowledgement indicator in a message type field of an IGMP message;
enabling the data processor to facilitate specifying a multicast group identifier associated with the particular multicast group in a multicast group identifier field of the IGMP message; and
enabling the data processor to facilitate specifying a negative acknowledgement indicator in an acknowledgment type field of the IGMP message, the negative acknowledgement indicator designates the inability to implement the request for altering the present membership status.

27. The system of claim 26 wherein:

enabling the data processor to facilitate receiving the IGMP Membership Report message includes enabling the data processor to facilitate receiving an IGMP Membership Report message; and
the IGMP Membership Report message requests membership in a particular multicast group for receiving said designated multicast information.

28. The system of claim 27 wherein enabling the data processor to facilitate preparing the negative acknowledgment message includes enabling the data processor to facilitate specifying supplemental membership action information in an additional cause information field of the IGMP message.

29. The system of claim 26 wherein:

enabling the data processor to facilitate receiving the IGMP Membership Report message includes enabling the data processor to facilitate receiving an IGMP Leave Group message; and
the IGMP Leave Group message requests removal from a particular multicast group receiving said designated multicast information.

30. The system of claim 29 wherein enabling the data processor to facilitate preparing the negative acknowledgment message includes enabling the data processor to facilitate specifying supplemental membership action information in an additional cause information field of the IGMP message.

31. The system of claim 24 wherein enabling the data processor to facilitate:
determining the membership action includes enabling the data processor to
facilitate confirming an ability to implement the request for altering the present
membership status; and
preparing the membership acknowledge message includes enabling the data
processor to facilitate preparing an affirmative acknowledge message.

32. The system of claim 31 wherein enabling the data processor to facilitate preparing the
affirmative acknowledge message includes:
enabling the data processor to facilitate specifying an acknowledgement indicator
in a message type field of an IGMP message;
enabling the data processor to facilitate specifying a multicast group identifier
associated with the particular multicast group in a multicast group identifier
field of the IGMP message; and
enabling the data processor to facilitate specifying an affirmative
acknowledgement indicator in an acknowledgment type field of the IGMP
message, the affirmative acknowledgement indicator designates the ability to
implement the request for altering the present membership status.

33. The system of claim 32 wherein:
enabling the data processor to facilitate receiving the IGMP Membership Report
message includes enabling the data processor to facilitate receiving an IGMP
Leave Group message; and
the IGMP Leave Group message requests removal from a particular multicast
group receiving said designated multicast information.

34. The system of claim 32 wherein:
enabling the data processor to facilitate receiving the IGMP Membership Report
message includes enabling the data processor to facilitate receiving an IGMP
Membership Report message; and
the IGMP Membership Report message requests membership in a particular
multicast group for receiving said designated multicast information.